

Amendments to Drawings

The attached sheets of drawings (Replacement Sheet 2 of 3 and Replacement Sheet 3 of 3) include a change to Figure 2 and a change to Figure 4.

In Figure 2 on Replacement Sheet 2/3 the optics module has been properly identified with numeral 124. This correction replaces the improper identification with numeral 126.

In Figure 4 on Replacement Sheet 3/3 the flexible gas line is now identified with numeral 110 and a lead line.

The numeral corrections made in these replacement sheets are believed to correct errors made in the original drawings and objected to by the Examiner.

Attachments: Replacement Sheets 2/3 and 3/3.

Remarks

Claims 17-22 are subject to a restriction requirement and withdrawn from consideration in this application.

Amendments to the Application

The drawings have been amended on the enclosed Replacement Sheets to correct a numeral (124) in Figure 2 and to add missing numeral 110 and lead line in Figure 4. It is believed that the basis for the objection to the drawings has been corrected.

Independent claims 1 and 13 have been amended to more clearly state the invention. Each of these independent claims now recites a welding method in which a flexible articulate tubular device is used, separate from the welding apparatus, to track a target weld path and deliver a gaseous flux (a shielding gas) to the weld bead. The weld track is progressively formed as illustrated in Figures 1 and 2 (and described in the related text) and the delivery tube is moved and articulated to follow the weld path as it is formed. In the embodiment of claim 13, an assembly of components to be welded has an upper side, for engagement with the arc welder or other welding apparatus, and an underside. In method claim 13 the tubular device follows the weld track on the under side of the assembly being welded.

Claim 14 (dependent on claim 13) recites a preferred embodiment of the invention in which tubes are being welded from their outer side and the articulate tubular device tracks the weld path from the inside of the assembly.

These amendments to Claims 1, 13, and 14 are supported by the drawing Figures 1-5 and the related text in the specification.

The Claim Rejections

Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. The Examiner is respectfully requested to reconsider this rejection in view of the current amendment of claim 13.

Claims 1-6 and 11-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Webb (US 3,450,857).

Claims 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Webb (US 3,450,857) as applied to claim 6 above, and further in view of Corby, Jr. et al (US 4,532,405).

Claims 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Webb and Corby as applied to claim 8 above, and further in view of Berg et al (US 6,888,972 B2).

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Webb (US 3,450,857) as applied to claim 14 above, and further in view of Corby, Jr. et al (US 4,532,405).

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Webb (US 3,450,857) as applied to claim 14 above, and further in view of Berg et al (US 6,888,972 B2).

The Examiner is respectfully requested to reconsider and withdraw each of these rejections under Sections 102 and 103 for the following reasons.

Reasons for Withdrawing the Claim Rejections.

Applicants' method claims 1-16 recite methods in which a flexible articulate tubular device is used in welding operations separately from the welding apparatuses that fuse metal to produce a weld track and bead. The methods are used in situations where a weld track is progressively formed, such as by relative motion between a welding apparatus and a workpiece(s). The flexible tubular device is positioned and moved to follow the progressively forming weld and deliver a gaseous flux over the molten metal.

As recited in independent claims 1 and 13, the flexible tube has an inlet at one end for receiving a supply of gaseous flux. The gaseous flux is conducted through the tube to a terminus at the other tube end for discharge of the gas toward a target weld path. The flexible tube is articulated to direct the terminus of the device at the advancing weld path and preferably at the leading edge of a weld bead (claims 2, 6, 8, and 14). In preferred embodiments, visual signals from the terminus of the device are used in positioning the terminus of the tube at the weld track (claims 7 and 15). And, in other preferred embodiments, thermal signals are used in directing the motion of the terminus of the articulate tube in following the weld track (claims 9, 10, and 16). The methods of claims 1-16 are different from any method taught or suggested by the Webb '857 patent or any combination of Webb with the Corby, Jr. et al '405 patent or Berg et al '972 patent.

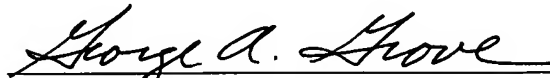
The Webb gas shielding device cannot be used in accordance with a method recited in any of claims 1-6 and 11-14. Webb disperses gas through an entire porous wall of his device. Webb does not disclose a method in which a shielding gas for welding is conducted from an inlet end of a flexible articulate tube to a terminus at the other end. The Webb disclosure does not contemplate a method of articulating (moving) the terminus of a flexible tube to continually follow an advancing weld track formed by relative motion between the welding apparatus and the assembly of components. The disclosure of Webb does not anticipate the subject matter of any of claims 1-6 and 11-14 and the Section 102 (b) rejection based on Webb should be withdrawn.

Applicants' claims 7 and 15 recite methods in which visual signals are conveyed from the terminus of the flexible tube and used in moving the terminus to follow the progressing welding track. The Webb disclosure is combined with the Corby, Jr. disclosure in rejection of claims 7 and 15. Claim 8 calls for further positioning an initially located terminus. But Webb does not disclose the methods recited in applicants' base claims and Corby does not contemplate the use of a separate shielding gas delivery device to track a progressing weld track. Corby uses an integral welder and gas delivery apparatus that also contains optics for assessing the weld. But no combination of Webb and Corby teaches or suggest applicants' methods of delivering shielding gas through a separate flexible articulate delivery tube and using visual signals from the terminus of the tube to direct the tube along a progressing weld track. The rejection of claims 7, 8, and 15 should be withdrawn.

Applicants' claims 9, 10 and 16 recite methods in which temperature measurements are conveyed from the terminus of the flexible tube and used in guiding the terminus to follow the progressing welding track. The Webb disclosure is combined with the Berg or Berg and Corby, Jr. disclosures in rejection of these claims. But Webb does not disclose the methods recited in applicants' base claims and neither Berg nor Corby contemplates the use of a separate shielding gas delivery device to track a progressing weld track. No combination of Webb and Corby, or no combination of Webb, Corby and Berg teaches or suggest applicants' methods of delivering shielding gas through a separate flexible articulate delivery tube and using temperature signals from the terminus of the tube to direct the tube along a progressing weld track.

It is respectfully requested that each rejection of applicants' claims 1-16 be reconsidered and that they be allowed and this case passed to issue. Withdrawn claims 17-22 may be cancelled upon allowance of claims 1-16.

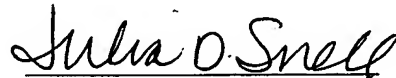
Respectfully Submitted,



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